THE MUSCULUS CRUCIFORMIS OF THE ORDER TELLINACEA.

BY H. VON IHERING.

During the winter of 1876–1877, I spent my time in studying the animals of the Pelecypoda in the rich collection of the Museum of Copenhagen, which were with great liberality placed at my disposal. Among the numerous still unpublished observations then made, there is one which I believe may be useful now, as it seems that no other zoölogist has hitherto observed and published the same.

All the members of the Tellinacea (Dall) have at the base of the siphons in the connected ventral parts of the margins of the mantle a singular muscle, formed by two crossing muscles which are inserted in the valves in the region of the angle formed by the mantle-impression and the sinus, or between it and the borders of the shell. Our fig. 1 shows their positions in *Sanguinolaria sanguinolenta* (Gm.). One of the two branches perforates the other, both being united into a cross-shaped muscle, which functionally may serve as a secondary adductor. I have examined this muscle in the following species: *Macoma lucerna* Hanley and *calcarea* Ch., *Tellina interrupta* Wood and *striata* Ch., *Soletellina violacea* Lam., *Sanguinolaria sanguinolenta* Gm., *Psammobia ferroensis* Ch., *Asaphis coccinea* Mart., *Donax cuneatus* L., *Semele reticulata* L., *Iphigenia brasiliana* Lam., *Tagelus gibbus* Spengler.

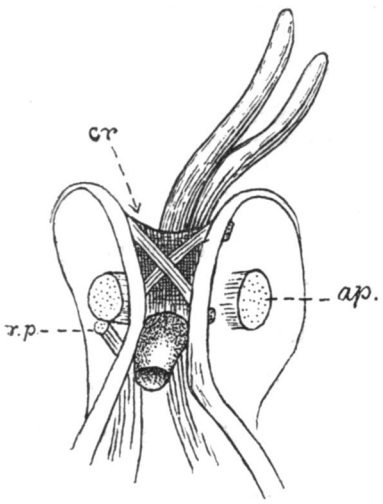

Fig. 1. Siphonal apparatus of *Sanguinolaria sanguinolenta* (Gm.). *ap*, posterior adductor; *rp*, posterior retractor; *cr*, cruciform muscle.

In all these different forms the general arrangement is the same,

but the development of the muscles, their insertions, etc., offer great variability. In *Tagelus* the muscle is very small and included in the mantel-edges, not producing separate scars of insertion. Somewhat stronger are the muscles in *Psammobia* and *Donax*, but as a rule they produce also no distinct scars of insertion. *Iphigenia* has the muscles strong but short. In the true *Tellina* and in *Macoma* the branches are slender and very long, and always the scars of insertion are quite well developed, as shown by our fig. 2.

Sometimes the insertion is different in relation to the distance of the scars in both valves, and sometimes one of the muscular branches is subdivided, producing thus two scars.

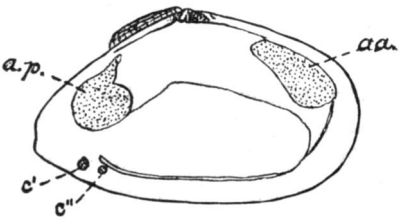

Fig. 2. *Tellina striata* Ch. *aa*, anterior adductor; *ap*, posterior adductor; *c'* and *c''*, scars of the insertions of the cruciform muscle.

All these differences are of secondary value. There can be, however, no doubt that the Tellinidæ offer the best and most typical development of the apparatus, and *Tagelus* the most rudimentary one. The conditions of the muscle in the genera *Solecurtus* and others apparently related to *Tagelus*, should be examined. Evidently the cruciform muscle is a special development of fibres of the mantel-edge which only secondarily have been isolated from these margins. This is, as I believe, the true origin also of the adductor muscles, which in their earliest state were situated in the mantel-edge and secondarily isolated and removed from it. The cruciform muscle forms a new and important character of the super-family Tellinaceæ, confirming the views of Prof. W. H. Dall.